

Action Research
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Workshop in School Program Development

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I. Introduction

My name is Guy Costello and I teach fifth grade at Lakeview School in South Milwaukee. I participated in the prairie education class offered by UW Madison during the summers of 1999 and 2000. This year I am taking the Workshop in School Program Development offered by the UW Madison (Graduate Course #630). I was a part-time teacher at Lakeview summer school for the environmental education – prairie restoration class. This summer I taught or organized five classes for this year's program. They consisted of:

- A class on invertebrates, natural selection, and an observation of earthworms
- A class on classification of leaves and how scientists create and use keys
- A presentation by a woman from the Humane Society on what to do if you find an injured wild animal and a she also brought a live great horned owl, and kestrel hawk into the classroom
- A presentation by the EPA on recycling and toxic clean-up procedures
- A field trip to the South Milwaukee Water Treatment Plant

There were 27 students in the program this summer. Their classroom teachers referred students to the program who needed additional help in math. Though most of the students were referred there were a few students who voluntarily signed up for the class out of interest in environmental education or because they took the class last year.

The students surveyed were a diverse group by age, gender, and academic ability. Fourteen (14) were male and seven (7) were female. One was African American, four (4) were Hispanic, one was Asian American, and fifteen (15) were white. The students were a mix of ages, 9 to 12, and of grade levels, 4th to 6th. Some of the students had taken the program last year, while others were taking it for the first time. The students were a mix of academic abilities including regular education students, learning disabled, emotionally disabled, and ESL.

The class was offered at Lakeview Elementary, Monday through Thursday from 8am until 11am. The class began on June 17 and ended on July 25, 2002.

II. Problem Statement

The students involved are incoming 4th, 5th, and 6th grade students at Lakeview who have struggled with math and shown themselves to be at risk for poor results on state and federal standardized tests.

Lakeview is a 50% poverty school, students have tended to score lower on standardized tests and to be at risk for learning difficulties in reading and math. Poverty and its effects are clearly an issue but we also suspect other issues such as class size, student-teacher ratio, and curriculum that is text based instead of hands-on and activity based.

The central problem is poor scores on standardized mathematics tests and an increasing volume of behavior issues represented in office referrals by classroom teachers.

The goal of the summer environmental program at Lakeview is to improve the math skills of a group of targeted students. We hope to achieve this by involving at risk students in a program that features a hand-on, activity based curriculum, small class size and a low student-teacher ratio, and an opportunity for students to do real work and make a personal connection with the environment through the creation of an on site prairie.

My initial proposal for action research was the following:

“The purpose of my action research is to investigate the impact of class size and reduced student-teacher ratio on the at risk students in the summer 2002 environmental education program at Lakeview School. To test the impact of class size I plan to compare students scores on a 2002 pre-test (which will be taken at the start of the six week session) with the results of the 2002 post-test which will be given at the end of the session. I also want to look at the number of office referrals for these students by comparing the number of school year referrals to the number of summer referrals. This would need to be done on a percentage basis – number of referrals / number of schools days – since the regular school year is significantly longer.”

After consultation with our course supervisor, Libby McCann, she suggested that I also conduct interviews of the participants at the end of the program to get an idea of their attitude, feelings, and experiences concerning the class.

Also as I began teaching this summer and observing the students in class factors other than class size and student-teacher ratio began to come to my attention. As I watched the students at work several other issues seemed to be having a positive impact on the students that in combination were creating a fun, positive, stress free atmosphere, which fostered learning. Some of these other issues were:

- The short time period
- The multi-age class
- The relaxed atmosphere that led to positive behavior by students who normally act out in the classroom during the regular school year.

Because of this observation I added additional questions to the survey in order to obtain student feedback on these other potential factors.

III. Description of the Research Process

The research will be done on several levels:

- 1) A pre and post test of math skills (see attached)
- 2) A study of office referrals comparing the regular school year to the summer program
- 3) Personal interviews of the participating students (see section IV for questions and responses)
- 4) General observations of the students during class and field trips

Student Survey

Background

Approximately twenty-seven (27) students participated in the summer environmental education class. But due to poor attendance by some students only twenty (20) actually took the pre and post-test in general mathematics skills. I conducted personal interviews with eighteen (18) of the twenty (20) students who were tested. I interviewed an additional three (3) students who did not take the pre and post-test. The surveys were conducted during the last three days of the summer session (July 23,24,25). The students were told that this was a survey to gather their opinions about the summer program, that this was not for a grade, that there were no right answers, and that by telling what they really thought they would be able to help us to learn how we can improve and make the summer program even better.

Survey Questions

- 1) Did you enjoy the summer environmental education class at Lakeview? Why?
- 2) What did you enjoy most about the class this summer? (If they need prompting ask about: being outside? activities? half day?)
- 3) Do you enjoy school during the regular school year? What do you enjoy most? What do you enjoy least?
- 4) If you could take things from this summer class and make them part of the regular school year, what would it be?
- 5) Did you ever get sent to the office this summer or get into serious trouble? Did you during the school year? Why do you think that you (or other kids) didn't get into trouble or sent to the office this summer but you (they) did during the school year?
- 6) Pick your number one favorite thing from the summer program, what was it?
- 7) Can you tell me something that you learned this summer that you'd always remember?

- 8) Did you enjoy having two or more teachers in the classroom? Why?
- 9) Which do you think is more stressful, the summer program or the regular school year? Why?
- 10) Do you have anything else you would like to share about the summer program that you'd like us to know that you haven't said already?

Survey Results by Question

1) Did you enjoy the summer environmental education class at Lakeview? Why?

Yes – 18 students, Kind of – 3 students

Comments: (Why did you enjoy it?)

- Summer school is like a fun school.
- It had more activities than other summer school classes.
- We did crafts and new stuff like fractions.
- I liked all of it except journaling.
- It was fun because of the field trips, the prairie, paper making, and drawing. It was not fun because of worksheets, teaching math, and because a lot of it was a review for me so it was boring.
- Yeah, I enjoyed it because math was fun and because of the neat projects. I wish we had had time to read.
- It was fun. I liked the math work and the field trips and recess.
- It liked the outside things.
- I liked the field trips and planting the prairie.
- We learned a lot about math in a fun way. We also did activities and hands on things that taught us. I liked the half-day.
- It was fun. We learned about plants, math, and fractions and we did fieldtrips.
- I went both years and it was fun because we learned about new things.
- I got to work with my hands, to take walks and go on fieldtrips. I like to work and to move and I don't like sitting and watching people talk.
- I like the prairie and math. I liked multiplication; it was a fun way to learn.
- I like math.
- There were a lot of fun activities like planting seeds and weeding the prairie, making grass mats, and making paper.
- There were a lot of things to keep busy, there were good teachers, I liked the fieldtrips, and making friends.
- There were fun activities
- I liked planting the prairie, division, and math. I didn't get to do as much as last year when we made stepping-stones and we caught bugs.

- I liked the prairie and the fieldtrips. I didn't like that we couldn't pick your own seat.
- I just didn't like some parts of summer school, some parts I do.

2) What did you enjoy most about the class this summer? (If they need prompting ask about: being outside? activities? half day?)

Comments: (#of responses)

- The prairie and learning about plants (10)
- Making paper (4)
- Weaving
- I wish this class went until 3 o'clock (4)
- Going outside
- I liked the class only being a half day (7)
- Math problems, math games, learning about math (6)
- Fieldtrips (8)
- The 9's trick
- Recess
- The owl lady
- Planting beans
- Making friends
- The teachers were nice
- Being outside and doing activities
- Everything

3) Do you enjoy school during the regular school year? What do you enjoy most? What do you enjoy least?

Responses:

Yes (11)

Sometimes (4)

I like summer school better (4)

Not much

Sometimes it's fun; sometimes it's not fun

Comments:

- The regular school year is really long, it's just work, and we have few fieldtrips
- I don't like sitting all day and listening

- Summer school has a lot more activities
- I don't like having to do work that I don't understand

Enjoy most: (# of responses)

- Time with friends (2)
- Getting grades and making my dad happy (1)
- Reading (3)
- Math (8)
- Art (2)
- Gym (3)
- Science (3)
- Having your own locker
- Camp Minikani (a three day outdoor environmental camp for 5th graders)
- Recess (2)
- Writing stuff down
- Lunch
- Music
- Fieldtrips (10)
- Favorite teachers

Least enjoy (# of responses)

- Teachers who keep us in our seats for two hours and we still don't get it
- Getting ignored when my hand is up
- Social studies (3)
- Gym
- Being picked on
- Music (2)
- Art
- Nothing (3)
- No prairie
- Homework
- When teachers yell
- We always have to work, my teacher in school made it harder, here she made problems shorter and she helped us
- Science (2)
- I don't like going to school
- Work almost every day
- Sitting and listening

- Summer school is better because of fun activities, it's more physical stuff, in school you sit in a dark room but in summer you get help, you do fun activities, you go outside, and the teachers explain things
- Math (2)

4) If you could take things from this summer class and make them part of the regular school year, what would it be?

Comments (# of responses)

- Fun stuff, make it fun
- Building the prairie (7)
- Games with learning
- More projects like mat making and timeline and cubes (3)
- More activities and games like Around the World (3)
- Math the way we did it here (2)
- Fieldtrips (6)
- Read more
- Do math games
- More environmental education
- A shorter school day
- Going to the library
- Getting outside and doing something
- Make it easier, regular school is too hard
- Teach the 9's trick and fraction

5) Did you ever get sent to the office this summer or get into serious trouble? Did you during the school year? Why do you think that you (or other kids) didn't get into trouble or sent to the office this summer but you (they) did during the school year?

Sent to the office during the summer: Yes – 0 / No – 21

Sent to the office during the regular school year: Yes – 9 / No – 12

Comments: (Why?)

- Regular school is longer and frustrating, you get angry, and then you get into trouble. It's very stressful because there is so much work, some times the room is hot or cold, and there is lots of noise.
- In summer you're more likely to be with your friends so you don't get into trouble. I get into trouble during those long recesses during school.
- It's more fun in the summer, it's only three hours, and you get more chances to get your energy out.

- Kids get bored during regular school.
- The regular day is longer and kids get stressed.
- Because they horse around.
- Summer school is more fun and the teachers make it kind of easy.
- During the school year my friends bother me, in the summer nobody bothers me.
- During the regular school year I get into trouble because of the people around me.
- During regular school I hang out with the wrong kids. I don't get in trouble with these kids.
- Summer is better because there are less people, it's fun, and there's more movement and activities.
- I don't know.
- During regular school the kids don't listen, the day is too long, and I don't like the stuff during regular school.
- Because regular school is boring, we get to go outside in summer school, it's fun, regular school is just work.
- I don't have any enemies here, the group is smaller, and the teachers always gave me work so I was always active.
- Summer is better because of fun activities, more physical stuff, during the school year you just sit in a dark room but not in summer, here you get help, you have fun outside, and the teachers explain things.
- Kids get into trouble in regular school because the hours are longer, and it's harder. In the summer we only do one subject.
- Self-control pills are helping me now. The teachers also help me in summer school and they are nice.
- I didn't know the kids here real well so I didn't play around with them.
- There are more nice kids in summer school and there are just mire kids during the regular school day so they are more likely to get into trouble.
- During regular school the teachers are mean and during the summer the teachers are very nice.

6) Pick your number one favorite thing from the summer program, what was it?

Favorite

(# of responses)

- Field trip to the water treatment plant (3)
- The teachers – they know how to make the kids have fun with projects
- Math – the teachers taught me how to do it without telling me, they kind of hid it as they taught it but then we knew it. I learned division. Fractions (and other math related responses) (5)
- Working and learning
- Field trip to Wehr (3)
- The owl and kestrel
- Planting and working on the prairie (4)
- Making paper (9)

- Planting lima beans (2)
- The walking field trips
- Trips to the library
- The Blakewood field trip

(There are more than 21 responses because some students had two favorites)

7) Can you tell me something that you learned this summer that you'd always remember?

Comments: (# of responses)

- How to make paper (3)
- The friends I made (2)
- The 9's trick (5)
- Multiplication (3)
- Division (3)
- Adding
- Fractions (2)
- Plant Parts and names (2)
- Weaving uses natural materials
- Parts of the ruler
- Respect, responsibility, and math

(There are more than 21 responses because some students stated two things.)

8) Did you enjoy having two or more teachers in the classroom? Why?

Responses: Yes / 19 Didn't make a difference / 2

- Two teachers can pay attention to the whole class
- If one teacher was busy the other could do stuff with us and they know what they're doing
- It was easier to get help
- They can teach you more things
- It makes you feel more comfortable; one is watching the class and the other can teach.
- Two teachers can get around more to help than one and one can help while the other corrects papers.
- Two teachers will help you, I had two last year.
- It's about the same as regular school where I also had two teachers.
- You don't have to wait for help.
- They're fun and nice.
- You can get work done faster.

- Two teachers can go to different places so you don't have to wait to get help.
- You get more attention; there are no drawbacks to two teachers.
- I usually have two teachers during the school year, you can get more things faster, one can help while the other is teaching, and you get stuff done.
- There are more teachers to help kids and to answer questions.
- With two teachers you have better control of the kids.
- In my school before Lakeview (in Washington state) we had two teachers and you could get help sooner.
- It didn't really make a difference.

9) Which do you think is more stressful, the summer program or the regular school year? Why?

Responses: Regular School / 20, Summer School / 1

Comments:

- Regular school has more hours, more work to do, more home work, and teachers yelling
- Homework and there are more recesses where you can get into trouble.
- Homework, report cards, worrying about grades
- More work, it's harder, you have to read more, homework.
- More work, bigger worksheets, more problems and a short time to get it all done. Also the other kids can be a problem, some are nice but some are mean.
- Kids picked on me, I didn't feel picked on at summer school.
- Summer school is fun and cool.
- Math is harder
- The day is longer, you have to learn more, and the teacher yells.
- I didn't know people and it made me nervous.
- Lots of work.
- I didn't know the kids at summer school and it made me nervous.
- The regular year is so long and it's tough when the rooms get hot.
- In regular school they don't explain as well, in summer school they explain better.
- Regular school is a long day, it's almost nine hours, you have more homework, and it's often past 5 o'clock before I'm done with everything.
- I'm shy and sometimes scared and at regular school they make fun of me.
- Summer school is easier and not a long day.
- During regular school there is more thinking, lots of subjects, and you can't go outside.
- During regular school your bike might get stolen, the day is longer and harder and you have less time at home.

10) Do you have anything else you would like to share about the summer program that you'd like us to know that you haven't said already?

Comments:

- I liked learning about plants and learning about a real prairie.
- I liked that this was new and trying to figure it all out.
- I thought the program was great; I liked the presenters and the animals.
- We should have more classes like this during the regular school year.

IV. Summary and Analysis of Data

Pre and Post Math Skills Test

Twenty of the 27 students who participated in the class were in attendance sufficiently over the six weeks to qualify to take the pre and post tests. As you can see from the attached graph of results every student saw improvement. The smallest improvement was 2% (68%-70%) and the largest was 60% (30%-90%). The class average or mean improvement was 22% (41%-63%). The median score improved from 34% for the pre-test to 66.5% for the posttest.

One student who I had during the regular year, Rigo, has very low academic skills and poor work habits. However, in the summer program he showed a real turn around and increased his score from 25% to 65%, a significant increase for a student whose skills are at a 1st to 3rd grade level.

Office Referrals

There were zero (0) office referrals for discipline issues during the 2002 summer program. In contrast nine students were referred during the regular school year several had multiple referrals. The previously mentioned student, Rigo, was never referred to the office and had no serious discipline issues during the summer. During the school year Rigo was referred for discipline issues at least once a month.

Student Survey

The interviews make it very clear that the participating students think very favorably of the summer environmental education program and wish that many aspects of it were incorporated into the regular school year.

The aspects of the summer program that were most enjoyed were that it was fun; that it is based on activities and projects; and that it provides opportunities for movement,

fieldtrips, and real work (planting and caring for the prairie). The two goals of the summer program are teaching environmental education and math skills through a hands-on, activity based study of the prairie. The survey shows that they have been very successful in sparking student interest in both of these areas.

The activities that were most appreciated by the students were all tasks and activities concerning the prairie (10 responses), the field trips (8), and math (6). The students also appreciated that the class was only half a day (7) – though several students wished it were longer.

Students also expressed a desire that many aspects of the summer program be extended to the regular school year. The students highlighted working on the prairie (7 responses), field trips (6), and game-fun math activities (7 related comments) as things they would like continued in regular school.

I was very impressed with the belief of many students that the summer school teachers made math fun and created learning opportunities for math without it feeling like math class. Also it should be noted that the largest group of responses for the favorite activity of the summer was math (5 responses). Also when asked what they would most likely remember from the program over one half of the responses were math related (14).

Having two or more teachers in the classroom was also seen as very positive. Having two teachers allowed students to get help quickly and when they needed it without extended wait time. Two teachers also improved control and improved student behavior. This helps students feel more relaxed and able to concentrate on learning.

The students were also quite candid about why no students were referred to the office during the summer program while several students had multiple referrals during the school year. The students cited the length of the school day; the volume of class and homework; the need to be in their seats for long periods of time; the lack of movement, projects, and activities; the pressure of peers, the lack of fun; high stress; and yelling teachers as factors that lead to poor student behavior.

I wish to note that the multiage mix of summer school, rarely found in regular school, may help create a situation with less tension, stress, and peer pressure. It also offered many opportunities, some I observed personally, where students took on the responsibility of helping their fellow students. When a student needed help another student who had already mastered the skill was quick to lend a hand. It was also interesting to observe that students of all ages and levels of academic skill were willing and excited about helping others. Peer assistance quickly became a very natural and common practice during the summer program.

Finally, the students clearly see the regular school day as significantly more stressful than the summer environmental education program. The issues that create that stress are almost identical to those that caused students to get into trouble. These issues are length

of school day, the volume of work and homework, peer pressures, noise and yelling, and the lack of fun activities.

V. Action Plan & Implications for Practice

The summer environmental education program at Lakeview School is succeeding in creating a safe, stress free, and motivating atmosphere where children can enjoy learning, and improve their academic skills. The students' perception of the atmosphere created by the summer program contrasts greatly with their perception of the regular school year which they see as long, boring, stressful, and a situation where they or other students are likely to get into trouble.

Based on these student responses and the measurable success they showed in math skills and behavior I would recommend the following steps are taken to incorporate aspects of the summer program into our regular school year.

Recommendations:

- 1) Shorten instruction time during the regular school day to no more than three (3) hours.
- 2) Encourage multiage groupings of students to reduce peer pressure and increase peer assistance.
- 3) Have two or more teachers per classroom and a student-teacher ratio of between 10-15 students to one teacher.
- 4) Create curriculum and train teachers to use curriculum that is activity based. Give teachers time for collaboration and planning so this style of curriculum can be used. Teachers do not disagree with the use of activity-based curriculum. They just don't have the time to prepare for it.
- 5) Focus on one area of the curriculum for a four to six week period. Trying to get students, especially young students, to handle four to five curriculum areas at once is just too much.
- 6) Give students an opportunity to have a real connection with the earth. The simple act of putting one's hands into the soil has a positive impact on students that cannot be over estimated. Also, we should create opportunities for children to do real work, to create something they can be proud of. The ownership and pride that the students this summer take in their prairie is an excellent example of this.
- 7) Plan as many field trips as possible including walking field trips to area services, sites, and businesses. The students at Lakeview are from predominately low-

income families. They do not get the opportunity that many children from higher-income families do to go on vacations or take weekend trips to museums or events. There are many rich learning opportunities right in our community and we should take better advantage of them.

- 8) We should look at all possible ways to reduce stress during the regular school day. I realize that a situation with 350 students (regular school year) will always be more stressful than one with 50 students (summer school) but things could be done to reduce noise levels, create small multiage groupings, and soften lighting. I also think that the effectiveness of homework in today's classroom or at least controls on volume should be considered.
- 9) Make it fun and don't yell!

VI. Final Reflections

The action research conducted this summer represents just the tip of the iceberg for potential study into the positive effects of the summer environmental education program. Study should definitely continue with thought being given to testing some of these ideas during the regular school year. I would welcome the opportunity to test them within my own 5th grade classroom. I am very intrigued by the issue of stress in the classroom; it's negative effect on students and teachers, and what we can continue to learn from the summer program about how we can create less stressful learning environments. I think this is especially important for our at risk, learning or emotionally disabled students, and shy students who are often overwhelmed by the dynamics of the regular classroom.

Finally, I would like to thank Al Block for his initiative in putting together this excellent program; he took a very good idea and brought it to life. I'd also like to thank Shannon Dardis, and Ann Schmitz for their outstanding efforts to create a program and classroom that is a model of excellence for all educators to study and follow. It was a pleasure to work with and learn from them.